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**REVISED MEETING NOTES**

**TO:** Distribution **DATE:** August 23, 1994  
**FROM:** Philip Nixon **PROJECT:** Solar Pond IM/IRA  
**MEMO #:** SP307:090694.05

**ATTENDANCE:**

Phil Nixon  
 Andy Ledford, EG&G  
 Harlen Ainscough, CDPHE  
 Arturo Duran, EPA  
 Frazer Lockhart, DOE  
 Steve Howard, DOE/SAIC  
 Shaleigh Whitesell, PRC  
 Scott Surovchak, DOE  
 Joe Schieffelin, CDPHE  
 Gary Baughman, CDPHE  
 Fred Dowsett, CDPHE  
 Ed Kray, CDPHE  
 Tom Broderick, ERM  
 Martin Hestmark, EPA

**DISTRIBUTION:**

Randy Ogg, EG&G  
 Mark Austin, EG&G  
 Michelle McKee, EG&G  
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 Steve Keith, EG&G  
 Steve Cooke, EG&G  
 Toni Moore, EG&G  
 R. Popish EG&G (Admin.  
 Record) (2)  
 Peg Witherill, DOE/SAIC  
 Jeff Ciocco, DOE  
 Jesse Roberson, DOE  
 Bob Siegrist, LATO  
 Alan McGregor, ERM  
 John Haasbeek, ERM  
 Marcia Dibiasi, IGO  
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 R. Wilkinson  
 T. Kuykendall  
 Central Files

**SUBJECT:** Weekly Status Meeting

Frazer Lockhart presented the results of the dispute resolution reevaluation as they relate to the project design. He mentioned that the design process is an evolutionary process that has been based upon the presumptive remedy that resulted from the Summer 1993 dispute resolution. Frazer indicated that the results of the work that has been performed over the last year have indicated that the presumptive remedy was appropriate. This has been confirmed by the working groups reevaluation of the design baseline.

Frazer Lockhart summarized the DOE design process and indicated that the enhanced conceptual design (40 percent complete) is finished. The DOE is beginning the Title Design process which consists of :

- 1) Calculations
- 2) Construction Drawings
- 3) Specifications
- 4) Construction Schedule
- 5) Cost Estimate

The key design basis goals include:

- 1) Infiltration Abatement
- 2) Durability (1000 year)
- 3) Ground Water Protection
- 4) Capacity for Material Consolidation
- 5) Program Optimization

Frazer noted that the working group had defined the extent of the contamination by statistically analyzing the Phase I RFI/RI data with respect to background concentrations and to risk based levels. The risk based levels were calculated using equations for the onsite resident exposure scenario. The Preliminary Remediation Goal (PRG) for a contaminant is the higher of the calculated risk based concentration or the background concentration. Diagrams were shown depicting the areal and vertical extent of contamination. Surficial soils are contaminated on the hillside north of the Solar Evaporation Ponds (SEPs). Vadose zone contamination is only detected beneath the SEPs. It was noted that the sludge contaminant concentrations are very similar to the contaminant concentrations detected in surface soils. In some cases the surface soil contaminant concentrations are greater than the sludge concentrations (Americium is an example). Fred Dowsett questioned why the Gross Alpha and Gross beta data for the sludge does not appear to be consistent with the isotopic analysis data. The primary reason is because the isotopic analysis was performed by a different subcontractor at a different time. The labs and detection limits were also different between the data sets.

It was discussed that the DOE did not perform a detailed hazardous waste determination because the CDPHE considered that the liners were hazardous because they were in contact with mixed hazardous waste that contained "listed" constituents. The DOE did not elect to refute the

CDPHE position on this issue which also led to the applicability of the Part 2 Hazardous Waste Landfill Siting Criteria.

Frazer Lockhart presented the conceptual design. The design is based on research from the Las Alamos and Hanford sites. These sites have been studying engineered covers in semi-arid environments for 5-8 years. The IM/IRA conceptual design uses many of the concepts from this research, but optimizes the concepts for application at the Rocky Flats Environmental Technology Site (RFETS). The design features an engineered cover to prevent upward exposure and precipitation infiltration. In addition the design includes a subsurface drainage layer to prevent potentially rising ground water from contacting the consolidated contaminated materials. Martin Hestmark questioned whether the subsurface drainage layer would provide any benefits with respect to ground water remediation. Frazer answered that the subsurface drain was not intended to support ground water remediation, but would prevent potentially rising ground water from becoming contaminated. Fred Dowsett questioned what the anticipated ground water quality would be exiting the subsurface drainage system. Scott Surovchak indicated that the quality of the ground water would be expected to at least initially resemble the water quality in the ITS. It was discussed that ground water remediation was intended to be addressed separately if necessary under the Phase II program. Fred Dowsett indicated that the closure may have impacts on the hydraulics of the OU4 area. Frazer Lockhart agreed that hydraulic impacts from closing the SEPs would be possible.

Frazer Lockhart explained that the upper layers of the proposed engineered cover function to support vegetation growth, minimize erosion and prevent fine grain soil particles from infiltrating into the biotic barrier/capillary break. Evapotranspiration in semi-arid environments can be highly effective at removing water that infiltrates into the soils. Due to the capillary break, water will not infiltrate the biotic barrier unless the upper fine grain soils become saturated. The low-permeability asphalt composite layer is positioned beneath the biotic barrier/capillary break to prevent any liquid from migrating into the waste zone. Frazer stated that asphalt is a natural material with a very low demonstrated permeability. In addition, the hydraulic conductivity requirement ( $1.0 \times 10^{-7}$  cm/sec) could be achieved with a thin layer of asphalt as opposed to a 2-3 feet thick layer of clay. It was also noted that clay materials can desiccate in semi-arid environments. Martin Hestmark cautioned that the gravel mulch may need to be larger than what was portrayed on the conceptual drawings because heavy rainfall at other sites in Colorado has caused pea gravel to erode. Phil Nixon stated that certain areas of the engineered cover which would be subjected to substantial amounts of runoff would be covered with rip rap to prevent erosion.

It was agreed that the proposed IM/IRA is a "dirty closure" with respect to the regulations. Frazer Lockhart stated that excavating to the mean seasonal high water table elevation would leave approximately 1 foot of potentially contaminated material beneath the subsurface drain. It was discussed that this approximate 1 foot layer provided a negligible residual risk and would likely be flushed by the seasonal rise in ground water during the period of ground water remediation. The IM/IRA closure achieves the goal of being protective of human health and the

environment. Frazer Lockhart acknowledged that the DOE has developed a conservative design due to the fact that there are materials proposed to be consolidated beneath the engineered cover which are not completely characterized, and because there are uncertainties inherent to the models used to assess the protectiveness of the design. Harlen Ainscough pointed out that the design is anticipated to be protective of ground water with respect to the State Standards for ground water protection.

One issue that was particularly evaluated during the dispute resolution concerned whether the engineered cover had the capacity to consolidate the various waste forms that DOE proposed to disposition beneath the engineered cover. Frazer Lockhart stated that the soils and liners which DOE always proposed to consolidate beneath the engineered cover make up approximately 90 percent of the material. The additional materials comprise the remaining 10 percent. This 10 percent is a very small volume of material that should have little impact on the physical extent of the "Z"-shaped engineered cover.

Frazer Lockhart reviewed the reevaluation results of the remaining ten items, and referenced the group to the summary memo that had been prepared to document the findings/results of the reevaluation. Significant discussions included:

- 1) Fred Dowsett asked how the site assessment for the IM/IRA differed from the procedure that DOE was using nationally to assess the locations for hazardous waste disposal sites. Frazer Lockhart agreed to investigate the methods that the DOE waste management groups were using to locate disposal sites and compare/contrast these methods to the methodology that was used for the IM/IRA.
- 2) Joe Scheffelin would like the working group to prioritize the waste forms for consolidation in the event that the engineered cover's capacity becomes an issue in the future. Frazer Lockhart stated that this would be addressed in the future if the capacity becomes a limiting factor in the engineered cover design.

Frazer Lockhart stated that the working group could not reach agreement on two technical issues:

- 1) The status of sludge as a remediation waste
- 2) Demonstrating that consolidating sludge beneath the engineered cover was an enhancement.

Frazer Lockhart pointed out that DOE considered that the best approach to consolidating the materials was to request a Corrective Actions Management Unit (CAMU) which would permit the consolidation of all the wastes beneath the engineered cover. Otherwise, the Land Disposal Restriction minimum treatment requirements would need to be met. The approval of the CAMU, with respect to the inclusion of sludge, is dependent upon classifying the materials as remediation waste, or demonstrating that the consolidation is an enhancement to site remediation, which would indicate that the materials should be considered remediation waste. Frazer

Lockhart indicated that there are no federally or state promulgated criteria for demonstrating enhancement. The working group identified the following criteria:

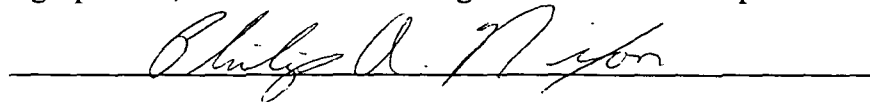
- 1) Absence of negative impacts
- 2) Cost enhancement
- 3) Schedule enhancement
- 4) Risk avoidance

The working group agreed in previous meetings that the inclusion of sludge in the IM/IRA would be an enhancement to the RFETS remediation. Waste disposal would be addressed earlier than anticipated at a significant cost savings (with respect to future offsite disposal). The proposed IM/IRA is protective of human health and the environment. Additional waste storage capacity would become available.

Frazer Lockhart stated that the DOE considers the sludge to be remediation waste since the DOE has been working towards closure/remediation since the mid 1980s. The CDPHE indicated that in 1989 the DOE made a commitment to dispose of the sludge offsite. In addition, wastes were illegally disposed in SEP 207-C in 1987/1988. Therefore, CDPHE could require (as an enforcement issue) that DOE remove the sludge from this SEP. Gary Baughman indicated that if the consolidation of sludge beneath the engineered cover was determined to be protective of human health and the environment, then the CDPHE could approve that the material be considered and managed as remediation waste. Fred Dowsett requested that DOE determine the percentage of the sludge that exceeds the LDR requirements.

Frazer Lockhart requested that the existing pondcrete also be considered remediation waste and be dispositioned beneath the engineered cover. He stated that this was appropriate for the same reasons that the sludge is remediation waste. Fred Dowsett stated that DOE had not presented modeling results specifying that the inclusion of pondcrete was protective of human health and the environment. Frazer stated that the modeling would be performed. Fred Dowsett requested that DOE provide the percentage of the pondcrete that failed the LDR requirements. Gary Baughman stated that the sludge and the pondcrete were different regulatory issues. Martin Hestmark suggested that the group reconvene to discuss the inclusion of pondcrete beneath the engineered cover. The inclusion of pondcrete will be a topic for discussion in future working group meetings.

Frazer Lockhart specified that the DOE is proceeding with the current design at a cost risk to try to meet the IAG milestone date for construction. However, if the design concept changes during the detailed design process, then there will be significant schedule impacts.



Philip A. Nixon